

CLAIMS

What is claimed is:

- 5 1. A method of cost determination for paths between switches in a mesh, the process comprising:
defining a set of paths between each pair of the mesh switches;
calculating start-up costs for the paths; and
recalculating costs for the previously defined paths using a directed cost
protocol.
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2. The method of claim 1, wherein the directed cost protocol comprises
generating at a first switch a cost packet with path information associated
with a specific path.
- 15 3. The method of claim 2, wherein the directed cost protocol further
comprises unicasting the cost packet via the specific path to a second
switch.
4. The method of claim 3, wherein intermediate switches along the specific
20 path each add cost information to the cost packet prior to forwarding the
cost packet to a next switch along the specific path.
5. The method of claim 4 further comprising repeating the recalculation at
periodic intervals.
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6. The method of claim 5, wherein the directed cost protocol further
comprises piggybacking information for more than one path into the cost
packet.
- 30 7. The method of claim 1, wherein the previously defined paths are identified
by path tags inserted into packets sent between the mesh switches.

8. The method of claim 1, wherein start-up cost packets are flooded through the mesh in order to define the set of paths between each pair of mesh switches and calculate the start-up costs.
- 5 9. A switching mesh comprising multiple packet switches, the switching mesh including
means for defining a set of paths between each pair of the mesh switches;
means for calculating start-up costs for the paths; and
10 means for recalculating costs for the previously defined paths using a directed cost protocol.
10. The switching mesh of claim 9, wherein the previously defined paths are identified by path tags inserted into packets sent between the mesh
15 switches, and wherein start-up cost packets are flooded through the mesh in order to define the set of paths between each pair of mesh switches and calculate the start-up costs.
11. The switching mesh of claim 10, further comprising means for repeating
20 the recalculation at periodic intervals.
12. The switching mesh of claim 11, wherein the directed cost protocol comprises generation at a destination switch a cost packet with path
information associated with a specific path that begins at a source switch
25 and ends at the destination switch and unicast transmission of the cost packet via the specific path to the source switch.
13. The switching mesh of claim 12, wherein intermediate switches along the
specific path each add cost information to the cost packet prior to
30 forwarding the cost packet to a next switch along the specific path.

14. The switching mesh of claim 13, wherein the directed cost protocol further comprises piggybacking information for more than one path into the cost packet.
- 5 15. A packet switch apparatus in a switching mesh, the apparatus comprising:
a plurality of ports; and
a switch control device coupled to the plurality of ports,
wherein the switch control device is configured to execute directed cost
protocol instructions in order to recalculate costs for previously
10 defined paths.
16. The packet switch of claim 15, wherein the directed cost protocol instructions are configured to generate a cost packet with path information associated with a specific path between the packet switch and another
15 mesh switch.
17. The packet switch of claim 16, wherein the directed cost protocol instructions are further configured to unicast the cost packet via the specific path to the other mesh switch.
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18. The packet switch of claim 17, wherein the directed cost protocol instructions are further configured to repeat the recalculation of costs for previously defined paths at periodic time intervals.
- 25 19. The packet switch of claim 18, wherein the directed cost protocol instructions are further configured to piggyback information for more than one path into the cost packet.
20. The packet switch of claim 18, wherein the directed cost protocol instructions are further configured to perform a flood discovery of paths at
30 longer periodic time intervals.

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21. The packet switch of claim 20, wherein path costs determined by the flood discovery of paths are used to substitute more efficient paths for less efficient paths.